

its extent and duration. The special indications are to arrest suppuration and to prevent septicemia.

The history of the means and methods of treating carbuncle would fill a volume. Palliative means are useful and to be recommended if nothing better can be done. Many good surgeons advocate a purely expectant course and discard all active means, relying on internal medication, and treating it as a self-limited disease, not to be interfered with. Most surgeons, however, recognize the necessity of doing something to hasten the sloughing in order to relieve tension, and thus limit the extent of the disease and prevent absorption of diseased products.

Caustics, incisions—single, multiple, subcutaneous and the time-honored crucial incisions are relied on. These are to be recommended, also, if nothing more efficient can be done, but they are all inadequate to fulfill the indications, although they accomplish something. Scraping, as advocated by Page and Owen⁵, and Mr. Teale, of Leeds⁶, and even the "excision and scraping" as advocated by Rushton Parker⁷ are valuable means in certain stages, after sloughing has begun. But these means are properly applicable only to those cases where the disease has ceased to extend, and are to be considered only as adjuvants to the incisions and caustics.

The injection of various antiseptics into the mass before sloughing has begun, as advocated by some, would hardly be relied upon by any one who had an adequate conception of the anatomy and nature of the disease. But it is not my purpose to review and compare discarded or prevalent methods. As a substitute for all of these, I would advocate total extirpation of the indurated mass, as we would remove a benign tumor. If this is done early the entire skin can be saved. If it is done later, there will be some loss of skin over the original focus but the patient will be saved from all the dangers of septicemia—the cause of death in carbuncle, usually mis-called exhaustion. If the patient already have septicemia and there remains a ring of indurated tissue beyond the sloughing center, extirpation is still the best means of saving the patient's life. It should be resorted to in all cases, whatever the stage of progress, except those in which the disease has clearly run its course, when the excision and scraping of Rushton Parker would be sufficient.

It is a rational, life-saving and time-saving method, and will commend itself to all who try it. All the reasons that call for amputation of a gangrenous limb can be urged in favor of total extirpation of carbuncle. The writer has practiced total extirpation in all suitable cases for the last five or six years.

The technique of the operation requires but few words. Anesthesia is required, which should be as brief as possible and not profound if the patient already suffers from septicemia.

A crucial incision should extend to just beyond the borders of the induration. The four flaps are to be dissected up to the limits of the disease, which can usually be made out easily, contrary to what is generally taught. Then with the volsella forceps and a knife the mass is readily dissected from its attachments to the deep fascia and removed entire or in sections, according to its size and condition. The four flaps are then stitched together toward the center, more or less closely, according to the amount of necrosis and sloughing. When the extirpation is done early, there will often be no loss of skin and

but little subsequent discharge. There are no blood vessels in or under the skin in the carbuncular regions that should terrorize any one.

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UTRICULITIS; A CONTRIBUTION TO THE PATHOLOGY OF THE PROSTATIC UTRICLE.

BY WILLIAM T. BELFIELD, M.D.

CHICAGO.

It is well known that the genital organs of the adult vertebrate are developed from two primitive organs of the embryo, the bodies named for Wolff and Müller; and that the sex of the individual varies with the relative development attained by these organs. In the future male animal the Wolffian duct furnishes the genital canal—epididymis and vas deferens—while the Müllerian duct suffers more or less complete atrophy; in the future female, on the other hand, the Müllerian duct furnishes the genital canal—Fallopian tubes, uterus and vagina (to the

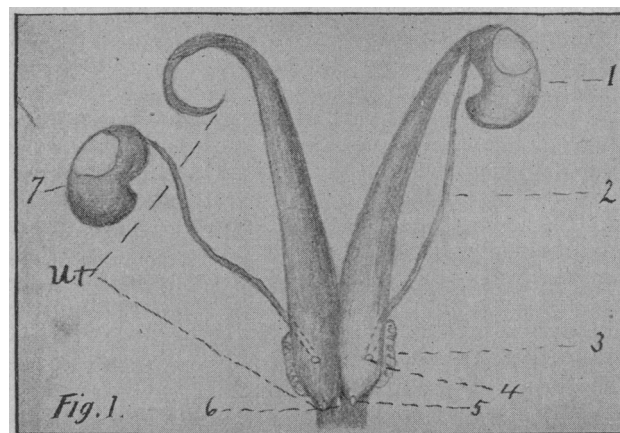


Fig. 1.—Internal genital organs of male guinea pig. 1, testicle; 2, vas deferens; 3, seminal vesicle; 4, orifice of vas deferens into uterus; 5, orifice of uterus into urethra; 6, verumontanum; 7, testicle displaced to show extremity of uterus; ut, right masculine uterus (Müllerian duct). Prostate not represented.

hymen)—the corresponding portions of the Wolffian duct suffering atrophy. In the most highly organized mammals, the male genital canal acquires certain accessory sexual glands not constantly found in the lower vertebrates—seminal vesicles, prostate, Cowper's, urethral and preputial glands—while the Müllerian duct exhibits marked atrophy; in man there persist regularly only the two rudimentary extremities of this duct, the hydatid of the testicle and the prostatic utricle.

Yet in some species the Müllerian tract retains in the male, side by side with the fully developed Wolffian canal, a high degree of elaboration; among the many species of mammals that I have personally dissected, none presents a clearer picture of the complete Müllerian duct in the male than the familiar guinea pig. In this animal the testicles are abdominal organs, lying somewhat below the kidneys; the usual organs of the male mammal are well developed, but in addition there are found two large

tapering tubes, each arising as a blind extremity behind the testicle, describing almost a complete circle, passing behind the urinary bladder, and after receiving the ejaculatory duct opening into the urethra at the side of the verumontanum (Fig. 1). Each tube is therefore the complete Müllerian duct, whose homology with the internal sexual organs of the female guinea pig becomes apparent by inspection of Figs. 1 and 2; the ovaries differ from the testicles in their greater proximity to the kidneys; the Müllerian ducts (uteri) retain separate cavities until they reach the vagina.

In the human male, the lower end of the Müllerian duct persists as the so-called masculine uterus or prostatic utricle; though it is evident from comparative anatomic study that this rudiment represents the vagina rather than the uterus of the female. The term "prostatic utricle" conveys a second misconception, derived from human anatomy, as to the relations between prostate and utricle—namely that the latter is merely an appendage of the prostate. While this is usually the anatomic relation in man,

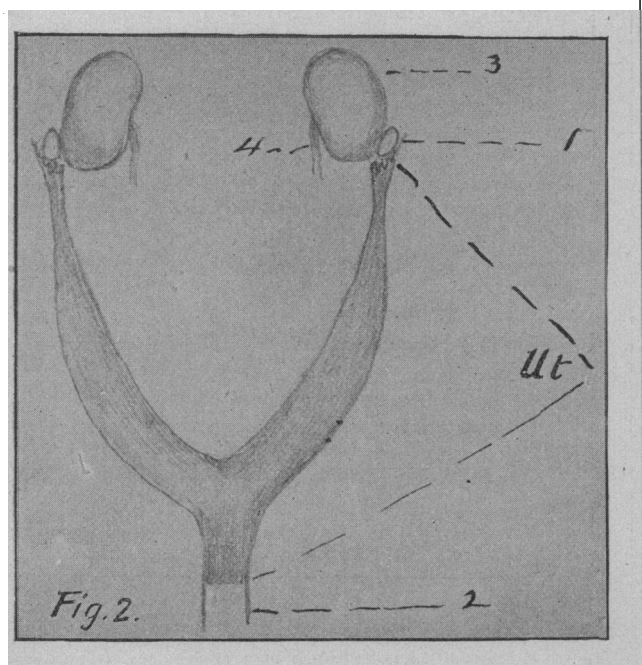


Fig. 2.—Internal genital organs of female guinea pig. 1, ovary; ut, left tube and uterus; 2, vagina; 3, kidney; 4, portion of ureter.

yet a study of their relations in various mammals shows this relative significance in the two organs to be reversed, *i. e.*, that the prostate is really an appendage of the utricle, an accessory and by no means constant gland of varied size and shape, always located—when present—at the orifice of the uterus (Müllerian duct). It is significant that in certain male mammals, *e. g.*, the ram, whose utricle is usually atrophied into a solid cord, the prostate is lacking entirely. In others—hare, squirrel, prairie-dog, for example—the prostate is a purely glandular structure which does not surround the urethra as in man, but lies entirely below this channel, being attached to the under surface of the utricle (Fig. 3); even in man the prostate is sometimes entirely suburethral—Dittel has dissected three such instances; and in the usual human prostate the glandular structures retain the original suburethral position, adjoining the utricle.

In a few animals, notably man, the prostate acquires an additional function—that of a vesical sphincter—quite foreign to its original universal office, that of a sexual gland; this is secured by the extension toward the bladder of muscular bands which encircle the urethra, *between this channel and the utricle* (Fig. 4).

This interposition of a complete muscular sphincter between utricle and urethra leads to the apparent burying of the utricle in the prostate; yet careful dissection will usually show that the body of the utricle is not surrounded by prostatic tissue; that it lies behind the prostatic sphincter (the "third lobe" of Sir E. Home) and between the upper ends of the lateral lobes, which separate to accommodate it (Fig. 5).

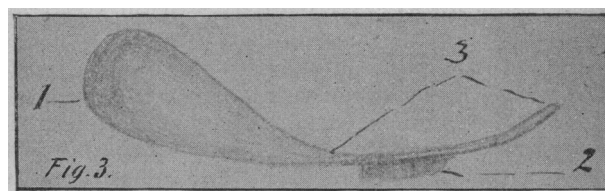


Fig. 3.—Part of bladder, prostate and urethra of hare, showing suburethral type of prostate found in many species. 1, bladder; 2, prostate; 3, urethra.

In other words its posterior surface and upper extremity are bordered, not by prostatic tissue but by the pelvic connective tissue. The clinical significance of this anatomic arrangement is apparent; a suppurative process in the utricle—and these must be frequent as extensions from the deep urethra—is separated from the pelvic connective tissue only by the thin wall of the utricle; it would seem *a priori* that peri-prostatic infection would be easier through the delicate extremity of the utricle than through the thick muscle and firm capsule of the prostate proper.

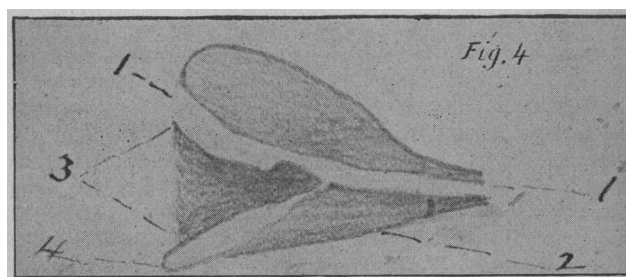


Fig. 4.—Longitudinal section human prostate, patient dead of consumption, aged 24. 1, urethra; 2, lateral lobe; 3, "third lobe" (between urethra and utricle); 4, utricle.

Though the pathologic and clinical possibilities of the utricle in man have been almost unnoticed, yet in a few cases the persistence of a large part of the Müllerian duct has been recognized; thus Martin records the persistence of Müller's ducts in a fetus at full time, and refers to a case wherein Boogaard discovered at the autopsy of an adult man, two complete Müllerian ducts extending from kidneys to urethra (Fig. 6). Rémy and Barth found in a 5-year-old boy a canal extending from a suprarenal capsule to the verumontanum, open from the summit of the

trigone; retention of urine requiring the use of the catheter, had repeatedly occurred. Reliquet found a complete Müller's duct in a man of 45 years. In Franque's case the Müllerian ducts of an adult man were found united into tubes, uterus and vagina opening into the prostatic urethra (Fig. 7).

Persistence of the entire Müllerian canal in the human male, as recorded in these cases, is doubtless a rare occurrence, a teratologic curiosity beyond clinical recognition or relief; but the distal extremity of the duct, the prostatic utricle, is a constant anatomic factor in man, to whose clinical importance it is the object of this paper to direct attention.

I have been able to find but one allusion to this topic in the literature accessible to me—the article of Englisch, who found in five out of seventy autopsies of new-born infants the utricle more or less distended, sometimes rivaling the urinary bladder in size; he suggests the probable dependence of urinary retention in the new-born upon the urethral obstruction due to this distended sac. There are recorded, however, several cases of retro-vesical cysts in adults, which, though apparently distended utricles, were assumed by the observers to have originated in the seminal vesicle. Thus N. R. Smith described as a

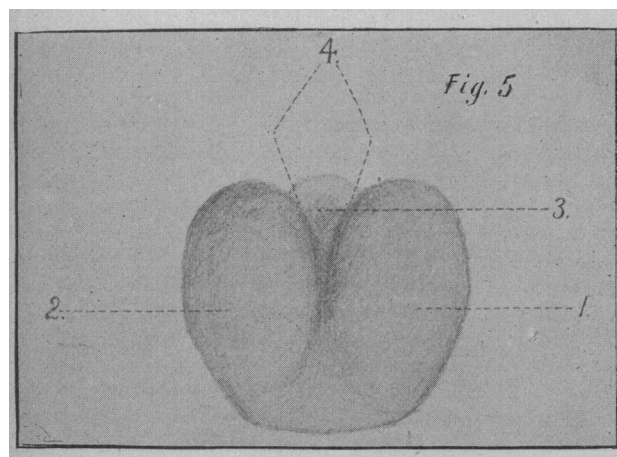


Fig. 5.—Rectal surface of human prostate (same as represented in longitudinal section in Fig. 4). 1, right lateral lobe; 2, left lateral lobe; 3, triangular space between upper extremities of lobes, occupied by utricle; 4, bristles passed into ejaculatory ducts.

“hydrocele of the seminal vesicle” in an adult, a pyriform tumor rising above the umbilicus and at first mistaken for a distended bladder; puncture per rectum evacuated ten pints of brown serous fluid. The description strongly suggests a distended utricle, the possibility of which is not mentioned by the observer. Ralfe records as a “cystic tumor of the left seminal vesicle” in an adult, a sac which was found on autopsy to have no communication with the vesicle, but arose from the prostate—probably a distended utricle; (evidently neither Smith's nor Ralfe's was a case of hydatid cyst, not uncommon in the male pelvis.)

The undistended utricle in man is a chestnut-shaped sac lined with mucous membrane in which are imbedded numerous racemose glands; its pointed extremity opens into the urethra through a narrow orifice in the verumontanum; its rounded base lies between rectum and bladder, and between the upper ends of the prostatic lobes laterally. Its depth, stated by anatomists to be one to one and one-half centimeters (four-tenths to six-tenths of an inch), I found to average in

twenty-seven adults nearly one and one-half centimeters; the greatest depth I have observed is two and one-half centimeters, though Adams has measured a utricle over three centimeters deep. Occasionally distinct bifid prolongations—vestiges of the separate Müllerian canals—have been observed. In man, the ejaculatory ducts usually run in the lateral walls to separate exits into the urethra; sometimes one and rarely both ducts open into the utricle—a more frequent arrangement in other animals.

The utricle might, therefore, be expected to exhibit two morbid conditions: 1, distension of the sac with its own secretion after occlusion of its narrow urethral orifice; and 2, suppurative inflammation by extension from the deep urethra; in this case septic infection of the recto-vesical connective tissue surrounding the upper extremity of the utricle—“peri-prostatic” inflammation and abscess—would be a natural possibility.

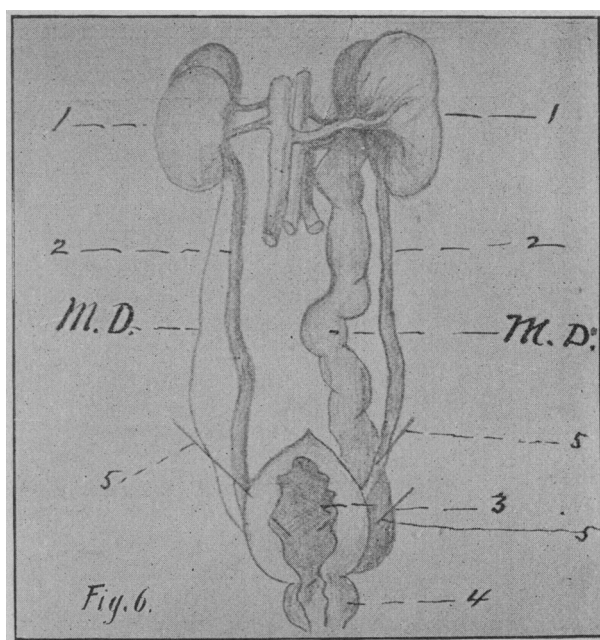


Fig. 6.—Müllerian ducts in adult man (Boogaard). 1, kidney; 2, ureter; 3, bladder; 4, prostate; 5, bristles in ureters and ducts; M.D., persistent Müllerian ducts (the right atrophied to a mere cord).

The first of these, the distension with physiologic products, has been proven by the observations of Englisch and others already mentioned; that supuration in the utricle and vicinity is the explanation of cases of chronic prostatitis, prostatic and peri-prostatic abscess, seems evident from the following personal observations:

Postmortem.—As prostatic suppuration is not commonly fatal, opportunity for postmortem observation is limited; only two cases have come under my observation since my attention has been directed to this subject:

1. A patient of Dr. J. C. Cook, of Hyde Park, Ill., about 40 years of age, had long suffered from the symptoms usual to vesical calculus; at intervals, bladder irritation and straining would become extreme, then several drachms of thick pus would be expelled from the urethra, after which the vesical symptoms would abate for a time, until the process was repeated—in short, a prostatic abscess seemed to

fill and discharge repeatedly. I saw the patient once with Dr. Cook; no stone was detected and a cystoscopic examination was agreed upon, but never executed. The patient dying a few weeks later of cystopyelitis, the bladder and prostate were kindly sent to me. There was a fibrous polyp of the fundus of the bladder; the utricle was over an inch deep, distended with pus, and projected nearly half an inch above the prostate; the surrounding recto-vesical tissue hard, the seminal vesicles somewhat distended but not inflamed.

2. A man 62 years old, upon whom I made suprapubic cystotomy for stone, died six weeks later of chronic uremia; the symptoms of vesical irritation persisted after operation. Autopsy showed chronic cysto-pyelitis; the utricle presented the appearance of an evacuated abscess cavity and extended almost to the level of the summit of the trigone; the recto-vesical connective tissue was brawny and contained a small abscess contiguous to, but apparently not communicating with, the utricular cavity.

Clinical.—While a clinical diagnosis of utricular abscess lacks the certainty of anatomic demonstration, yet the following cases seem incapable of other explanation:

A commercial traveler, aged 40, was referred to me by Dr. H. M. Lyman, of Chicago, in December, 1890. For three years he had had the usual history

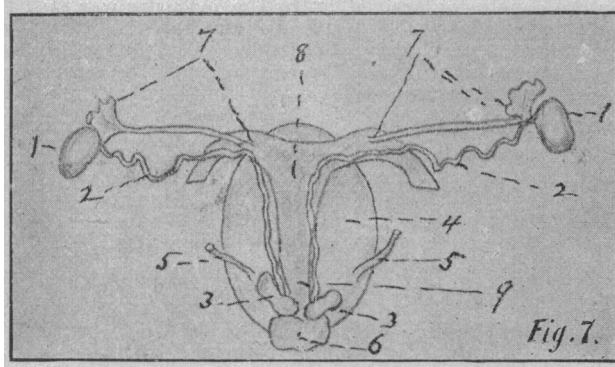


Fig. 7.—Müllerian ducts (tubes, uterus and vagina) in adult man (Franque). 1, testicle; 2, vas deferens; 3, seminal vesicle; 4, bladder; 5, ureter; 6, prostate; 7, Fallopian tube; 8, uterus; 9, vagina.

of chronic prostatitis in a marked degree, with much rectal irritation, though repeated examinations had failed to disclose any morbid condition of the rectum; no anterior urethritis in eighteen years. In December, 1890, after a severe jolting, the symptoms were aggravated, culminating ten days later in complete retention of urine. While straining to urinate he had a sensation as of "something breaking," immediately followed by a discharge per urethram of an ounce or more of thick, offensive pus; urination became at once possible.

I first saw him a few hours after this episode; the prostate was symmetrically swollen and tender, the space between the seminal vesicles tense and tender, the vesicles themselves not especially sensitive.

For several months, in spite of irrigations, injections and instillations of the deep urethra, the abscess cavity kept filling and at intervals discharging (with the urine) quantities of extremely fetid pus. I then made, in the Presbyterian Hospital, a perineal urethrotomy, expecting to find and curette a prostatic abscess cavity; but the prostatic urethra appeared to the finger quite normal. The operation

and subsequent drainage caused no appreciable improvement in the symptoms. About this time the probability that the utricle was the abscess cavity occurring to me, I passed a narrow knife from the perineum into the bladder between the upper extremities of the lateral prostatic lobes so as to pierce the utricle; a small drainage tube was left in the track of the knife, and the cavity irrigated with hydrogen peroxid. Complete healing was secured; urine and urination became normal and so remained a year later, when patient was last seen.

I can recall several prior cases which probably belonged to the same category, though unrecognized at the time; cases in which, as in the instance just related, perineal urethrotomy and drainage failed to relieve a chronic prostatic cystitis, or even to reveal any morbid feature of the bladder neck (tuberculosis having been certainly excluded); and in two cases of prostatic cystitis apparently due to early prostatic enlargement, thorough stretching of the prostate and drainage through a perineal incision failed to relieve, even temporarily, any of the symptoms. In one of these, complete relief followed the spontaneous emptying of a "prostatic" (perhaps utricular) abscess some months after operation. Two years ago while examining for Dr. Henrotin, of Chicago, a man 60 years old, suffering from prostatic cystitis attributed to prostatic enlargement, I compressed the recto-vesical tissue between a sound in the bladder and a finger in the rectum; the urine passed immediately afterwards contained a quantity of fetid pus. The symptoms of cystitis, which had been pronounced and constant for a year, entirely disappeared within two weeks; and fourteen months later urine and urination were still perfectly normal.

With Dr. W. K. Harrison, of Chicago, I saw a man 65 years old, who for several years had had the usual history of a prostatic; during the last six months urination had become practically dependent upon the catheter; the urine contained some blood but only a little pus. The prostate and recto-vesical tissue were swollen. Two days later I made a perineal urethrotomy; the exploring finger found a swelling at the floor of the urethro-vesical orifice which burst under pressure, discharging perhaps an ounce of pus; the empty cavity was found to occupy the position of the utricle. There was no decided hypertrophy of the prostate.

Such experiences have led me to think that utriculitis is often a factor in the production of the prostatic and vesical symptoms attributed to prostatic enlargement as well as of the apparent enlargement itself, which is certainly at times edematous and inflammatory rather than hypertrophic; and that operative measures for the relief of prostatic enlargement should provide for drainage of the prostatic urethra and of the utricle. I have elsewhere (JOURNAL AMERICAN MEDICAL ASSOCIATION, April 7, 1894) described, as "posterior prostatic cystotomy," an operation which seems to possess certain advantages over the supra-pubic incision; among others it affords access to the utricle, seminal vesicles and prostatic urethra, whose morbid conditions are apt to be confounded with "cystitis."

Summary.—1. The rudimentary extremity of the Müllerian duct in the human male, commonly termed the prostatic utricle, is not wholly inclosed by the prostate, but is partly bordered by the pelvic connective tissue.

2. It presents two morbid conditions: *a*, distension with the products of its own glands; and *b*, suppurative inflammation; the latter may infect the contiguous recto-vesical connective tissue.

3. The almost complete inclosure of the utricle by the prostate results in a community of morbid processes, and of clinical symptoms.

4. In cases of prostatic-cystitis from any cause, prostatic and peri-prostatic abscess, the possibly important rôle of the utricle should be considered.

5. Because of the minute size and frequent occlusion of the urethral orifice of the utricle, the usual methods of medicating the deep urethra can not be relied upon to influence a morbid process in the utricle itself.

6. The utricular cavity can be reached (aside from the possibilities of the endoscope) in three ways: *a*, through an aspirating needle passed from the perineum into the triangular space between the upper extremities of the lateral prostatic lobes; *b*, through a puncture with a narrow knife passed from perineum to bladder through the triangular space mentioned, with appropriate drainage; this can be readily added to the ordinary drainage of the bladder by perineal urethrotomy; *c*, by incision into the ischio-rectal fossa and separation of rectum from prostate.

7. Disease of the utricle seems to have been erroneously attributed to the seminal vesicle.

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CLINICAL HISTORY OF THE CASE OF PRESIDENT JAMES ABRAHAM GARFIELD.

BY ROBERT REYBURN, A.M., M.D.

PROFESSOR OF PHYSIOLOGY AND CLINICAL SURGERY MEDICAL DEPARTMENT HOWARD UNIVERSITY, WASHINGTON, D. C., AND ONE OF THE ATTENDING SURGEONS IN THE CASE OF PRESIDENT GARFIELD.

(Continued from page 549).

August 24, 8:30 A.M. Temperature 98.5; pulse 100; respirations 17. August 24, 12:30 P.M. Temperature 99.2; pulse 104; respirations 17. August 24, 6:30 P.M. Temperature 100.7; pulse 108; respirations 19.

August 24 8:30 A.M. The President passed a very good night awakening at longer intervals than during several nights past. He continues to take liquid food by the mouth with more relish, and in such quantity that the nutritive enemata were suspended for the present. Shortly after the noon bulletin was issued, an incision was made into the swelling on the right side of the President's face for the purpose of relieving the tension of the swollen parotid gland and giving vent to pus, a small quantity of which was evacuated by the operation. The seat of the incision was sprayed with carbolic acid, but no anesthetic was given him, and he bore the operation well. He has not suffered from nausea to-day. 6:30 P.M. His temperature this afternoon is, however, higher than yesterday at the same hour, and his pulse somewhat more frequent.

The President continues to be very anxious to leave the White House. To-day he asked Dr. Bliss

if he could be removed by the time cold weather came. Dr. Bliss told him he would be removed as soon as his stomach was all right. "It's all right now," said the President. "I want to get away. If we can't go to Mentor, I want to go down the river on the *Tallapoosa*." (Steamship.) The President slept most of the night, but his sleep was broken and disturbed. Professor Agnew, who had returned to Philadelphia on the 23rd inst., was telegraphed for, and joined in the morning consultation of the 25th.

August 25. This morning the President is taking liquid food in sufficient quantity so that the nutritive enemata have not been renewed. August 25, 8:30 A.M. Temperature 98.5; pulse 106; respirations 18. August 25, 12:30 P.M. Temperature 99.2; pulse 112; respirations 19. August 25, 6:30 P.M. Temperature 99.8; pulse 112; respirations 19.

Many statements having become current to the effect that the condition of the President was greatly influenced by the miasma generated by the marshes which existed south of the White House; the matter was carefully considered by the attending and consulting surgeons this morning, and they issued the following bulletin after the morning dressing of the wound:

AUGUST 25, 9:15 A.M.

The subject of the removal of the President from Washington at the present time was earnestly considered by us last night and again this morning. After mature deliberation the conclusion arrived at by the majority was that it would not now be prudent, although all agree that it will be very desirable at the earliest possible moment at which his condition may warrant it. We are, moreover, unanimously of the opinion that at no time since the injury has the President exhibited any symptoms of malaria.

(Signed)

FRANK H. HAMILTON,
 D. HAYES AGNEW,
 D. W. BLISS,
 J. K. BARNES,
 J. J. WOODWARD,
 ROBERT REYBURN.

A little more pus came from the incision in the parotid gland to-day, but the swelling of the gland remains stationary. During the past three days the President's demands for his removal to some other locality have been frequent and almost imperative. He is most anxious to go some place, but not to the Soldiers' Home. He will not think of that. He has been very restless over the subject, and his determination to be taken to another place has been the cause of much anxiety in the sick room. Upon that subject alone he has refused to be guided by his physicians and friends. He refuses to pay any attention whatever to statements that it was impossible to take him away from the White House. After he had been told that he could not with safety be removed, he would not be in the least convinced, but would still as earnestly and persistently say that he must get away. Mentor is where he specially wants to go. Next to that he wants to be taken on board the steamer *Tallapoosa* for a cruise upon the salt water. His persistence in this matter may perhaps be explained by the fact that whenever he went upon a sea voyage he was always greatly benefited thereby. At 6:30 P.M. the wound was dressed as usual, and no unfavorable change has been observed in his condition. He has taken by the mouth a sufficient supply of liquid food.

August 26, 8:30 A.M. The President slept most of the night, awakening at intervals of half an hour to an hour. On first awakening there was, as there has been for several nights past, some mental confusion,